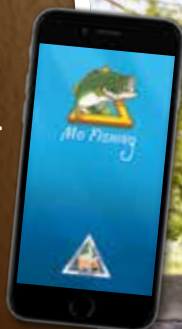


MISSOURI CONSERVATIONIST

VOLUME 82, ISSUE 9, SEPTEMBER 2021
SERVING NATURE & YOU



FISHING is a great way to spend time with family and friends and create memories that last a lifetime. All you need is a pole and a permit. No matter where you live in Missouri, a fishing trip is close to home. Finding places to fish is easy with the free mobile app — **MO Fishing**.



DISCOVER NATURE



Serving nature and you

catfish tacos with fresh-tomato salsa

Makes 4 to 6 tacos

- 1 pound catfish fillets
- 2 garlic cloves, minced
- 3 tablespoons fresh lime juice
- Salt and coarsely ground pepper
- 4 to 6 6-inch corn tortillas
- 2 cups chopped Romaine lettuce
- 1 avocado, cubed
- ¼ cup feta cheese, crumbled

Place fish on lightly oiled, rimmed baking sheet. Mix garlic and lime juice and drizzle mixture over fish. Sprinkle with salt and pepper. Let stand 15 minutes.

Broil fish in oven (you also may grill it) until opaque in center, 6 to 8 minutes. While fish is cooking, warm tortillas directly on a burner over lowest heat, turning once, until heated through. Watch carefully; the first side needs only 20 seconds or so, and the second side even less time. Alternatively, you may heat tortillas in a pan. Keep them warm in a tortilla basket lined with a cloth towel or napkin.

Cut fish into 1-inch pieces. Top each tortilla with lettuce, then fish. Drizzle with salsa and top with avocado and cheese. Serve with your favorite local ale.



Find more wild recipes in *Cooking Wild in Missouri*, available at most MDC nature centers. To order, call toll-free 877-521-8632.



Contents

SEPTEMBER 2021
VOLUME 82, ISSUE 9



FEATURES

10 The Scat Detective

Wildlife damage biologist helps homeowners identify mystery visitors.

by Tom Meister

17 Beyond the Classroom

Nature-based kindergarten takes learning outside.

by David Catlin

22 Bobwhites, Beef, and Bees

Missouri's quail restoration landscapes.

by Dave Hoover

SPECIAL INSERT

2021-2022
Seedling Order Form

DEPARTMENTS

- 2 Inbox
- 3 Up Front With Sara Parker Pauley
- 4 Nature Lab
- 5 In Brief
- 28 Get Outside
- 30 Places To Go
- 32 Wild Guide
- 33 Outdoor Calendar



MISSOURI CONSERVATIONIST



ON THE COVER

Northern bobwhite

📷 NOPPADOL PAOTHONG

500mm lens +2.0 teleconverter
f/8, 1/200 sec, ISO 400

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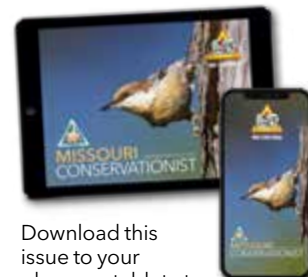
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Letters to the Editor

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MISSOURI
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PICK AN ADVENTURE
I just finished reading the July *Conservationist* and wanted to tell you how much I enjoyed *Pick an Outdoor Adventure*. It was wonderful. I feel like I truly had an adventure and never left my home.

Hazel Bledsoe
California

MISSOURI'S LEAST WANTED

When I understood how bad Callery pear trees are for our area, I scheduled to have mine removed. Then I saw *Missouri's Least Wanted* [Page 8] in the April issue. I laminated it and posted it by the tree for a few weeks before it was cut down. People stopped, read it, and asked me about it, wanting to know what I was going to plant instead (a lovely little serviceberry). I know of at least one neighbor who decided to get rid of their tree as well. And others are working on their bush honeysuckle removal now.

I'm so glad I did that rather than just chopping it down, leaving people to wonder why I got rid of that big blooming tree. Thanks so much for helping me educate my neighbors.

Sarah Whitney via email

To learn more about Callery pear trees, bush honeysuckle, or other invasive and nuisance species and what you can do to help stop their spread, visit short.mdc.mo.gov/ZjU. —THE EDITORS



LOYAL READERS

My parents lived in Missouri since 1998 and received the *Missouri Conservationist* for many years. They shared their copy with me, a state away, once they had read it. It's one of the few magazines I still take the time to sit down and read.

I appreciate it for being a conservation magazine that includes hunting as one of the things covered, just not the main thing. It gives a much more rounded approach to Missouri's nature resources.

Due to advancing age, my dad has moved to Kansas to live with us, but one of the things he insisted on is that he still receive his monthly copy of the *Missouri Conservationist*. I explained he would have to pay for it now, but that wasn't an issue; he still wanted to receive it.

We will both be happy to continue receiving your great magazine.

Dave Fairchild Shawnee, Kansas

START 'EM YOUNG

My granddaughter loves the outdoors and all critters. She receives *Xplor* and enjoys it with her sister and brother. Thanks for making a magazine for them so they can learn about nature and how to respect it.

Sheri Dawkins Ludlow

To learn more about Xplor magazine or to subscribe, visit mdc.mo.gov/xplor. —THE EDITORS

LOVE FOR MISSOURI

I didn't grow up in Missouri, but now have lived here 17 years. I'm genuinely impressed with the state and honored to call it home. You are part of its greatness. Your bulletins, magazines, educational programming, everything is phenomenal! Thank you for all you do to guard and care for our state's abundant natural resources and beauty.

Liesl McDowell St. Louis

COURTESY SHERI DAWKINS

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Have a Question for a Commissioner?

Send a note using our online contact form at mdc.mo.gov/commissioners.



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on your Instagram photos.



1

1 | Jack-o'-lantern
mushrooms by
by M. Cornine,
via email

2 | Turkey vulture
by Michael
Woods, via Flickr

3 | Viceroy by
tree-razzo,
via Flickr



2



3

MISSOURI CONSERVATION COMMISSIONERS



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Eckelkamp



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Up Front

with Sara Parker Pauley

✱ I was utterly depressed as my husband and I drove home after a week of meetings in the West. We thought we'd return through the Rockies for a view of scenic vistas, but our timing coincided with a thick fog from California wildfires, and we could barely see the mountains. The trip also coincided with the Intergovernmental Panel on Climate Change's latest report, which relayed even greater doom, about the fate of our planet due to intensifying impacts of climate change.

Someone once suggested I take a more serious tone in my Upfront column — to lay out the cold-hard reality about the state of conservation. There is no doubt we have challenges before us, including increasing impacts from climate change, loss of habitat and species, and even 12,000 species identified in this country as rare or in decline. But I also choose to find hope even in the darkest hours. Here in Missouri, there are signs of hope everywhere. We see promising restoration efforts like elk, ruffed grouse, and our newly reintroduced brown-headed nuthatch (see quail restoration article on Page 22). We also see partners doing their part to steward our resources every day.

We have much to be thankful for in Missouri where support for conservation remains strong. I smiled as we crossed the state line back into the Show-Me State. The haze had lifted. It was good to be home.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
SARA.PAULEY@MDC.MO.GOV

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Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

NATIVE BEE MANAGEMENT

Impacts of Neonicotinoids

✖ When headlines warn of pollinator losses, many people think of declining European honeybees. But Missouri is home to around 450 species of native bees that also provide essential pollination services for food crops and native wildflowers.

In the last 20 years, farmers have turned to neonicotinoids — a relatively new class of pesticides that mimic nicotine and are highly toxic to insects — to enhance crop production and control pests. Scientists have grown concerned that neonicotinoid residues could harm wild bee communities.

Starting in 2017, a team of researchers, including scientists from MDC, the University of Missouri (MU), and the U.S. Geological Survey Missouri Co-op Unit, conducted a two-year field study to assess whether neonicotinoid seed treatments influenced wild bee abundance and richness.

In 2017 and 2018, the team, led by Anson Main of MU's School of Natural Resources, planted 23 Missouri agricultural fields of soybeans using one of three seed treatments: untreated (no insecticide), treated with a



The study found that many common ground-nesting bees like this large sweat bee (*Agapostemon* sp.) declined in fields planted with neonicotinoid-treated crop seeds.

Study yielded important information for wildlife area management

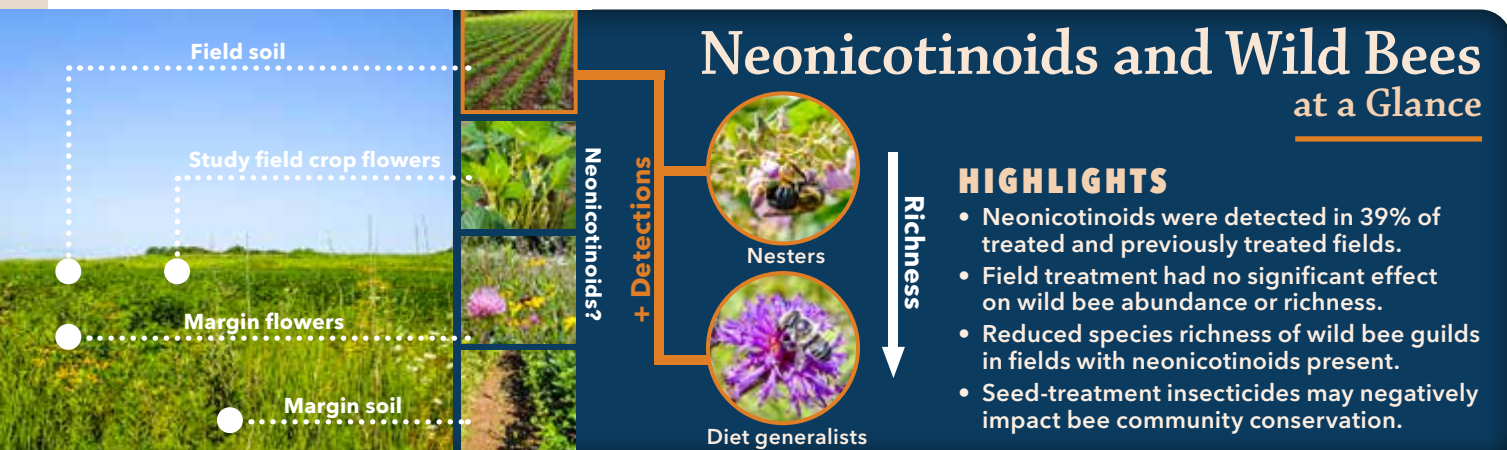
neonicotinoid active ingredient known as imidacloprid, or previously treated. During both years, the team collected wild bees from the study's field margins monthly from May to September. They also collected soil and flowers from fields and field margins.

Analysis showed that insecticide presence in soils and flowers varied over the study and that wild bee abundance and species richness were not significantly different among field treatments.

However, neonicotinoid presence in field soils was associated with significantly lower richness in ground- and above-ground-nesting wild bees.

"As 70 percent of wild bees nest in the ground and are valued pollinators, it is critical that we conserve our native bee populations," Main said.

The study concluded that eliminating neonicotinoid use on wildlife management areas may help sustain viable, diverse wild bee populations.



In Brief

News and updates from MDC



FALL MANAGED WATERFOWL RESERVATIONS OPEN SEPT. 1

MDC OFFERS MANAGED WATERFOWL HUNTING ON MORE THAN A DOZEN CONSERVATION AREAS, SPECIALLY MANAGED WITH A FOCUS ON WETLANDS

➔ The pre-season reservation period for MDC managed waterfowl hunts will run Sept. 1-18 with results posted Oct. 1. The in-season weekly drawings will take place on Monday afternoons with a seven-day application period that opens the Tuesday before and closes the Monday of the draw at 3 p.m.

Missouri residents and qualifying nonresidents, such as students from out of state or members of the military stationed in Missouri, can apply online for a reservation to guarantee an opportunity to hunt on a specific day on a specific area. Residents and nonresidents can also arrive at a managed waterfowl hunting area the morning they wish to hunt and wait in line for the possibility of getting a hunting spot.

Applicants for waterfowl reservations must have their required permits to apply, and their Federal Duck Stamp to hunt.

MDC also offers waterfowl hunting opportunities on other conservation areas. In addition, Missouri offers waterfowl hunting opportunities at numerous public and private locations around the state.

continued on Page 6 »

MANAGED WATERFOWL HUNTING (continued from Page 5)

For this fall, the waterfowl reservation system will offer 50 percent of daily hunting positions for the managed-hunt areas through online reservations. Of the 50 percent of spots allotted through online reservations, half will be for pre-season applications and half will be allocated during a weekly in-season application period. The remaining 50 percent of spots will be held for hunters who participate in the daily morning drawing and wait in the "poor line" for the possibility of getting a hunting spot.

"Under this reservation system, if an area offers 20 daily hunting positions, five will be allocated through pre-season reservations and five through in-season reservations," explained Joel Porath, who coordinates managed waterfowl hunts for MDC. "The remaining 10 positions will be allocated to hunters from the poor line the morning of each hunt."

Successful pre-season and in-season reservation applicants will be notified after their respective draws via email or text message with their hunt date, location, and pill assignment. "Pills" designate the order hunting parties select their hunting locations on the area. The lower the number, the sooner hunting parties get to select their hunting location.

"This will let reservation holders know before they leave their homes if their randomly generated number will enable them to be one of the first, middle, or last parties to pick their hunting location," said Porath.

Only one member from each hunting party will be allowed to have a staff member pull a pill for their respective party. Residents and nonresidents can hunt with a reservation holder, but hunting parties are limited to a maximum of four people.

Hunters with disabilities can apply to use ADA hunting blinds through the online reservation system during the same timeframe as the pre-season application period. ADA blinds that are not selected and allocated during the pre-season drawing will be placed in the weekly in-season draws.

"As with last season, MDC is prepared to use COVID-19 modifications implemented in the 2020-2021 waterfowl managed hunt process to assure the safety of hunters and staff if COVID conditions this season warrant these steps," Porath added. "These steps include staff working to implement plans to allocate hunting locations this season for vacant positions so hunting spots don't go unused."

For more information, visit short.mdc.mo.gov/Zj5 or get a copy of the *Migratory Bird and Waterfowl Hunting Digest 2021-2022*, available online and where permits are sold.

Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov
or call 573-522-4115, ext. 3848.

Q: A single bat has been living in the screened porch of our cabin. We have a bat shelter nearby, but the bat doesn't seem to be using it. Before we close the gaps near the roof, how can we provide an alternative shelter and relocate the bat without harming it?

➔ People commonly encounter single bats during late August and early September. This is likely a combination of two factors: juvenile individuals starting to explore the landscape and the general bat population entering its transition period into winter.

In terms of best practices, conservationists ask people to be patient during this time of year and wait three to four weeks before doing anything. These small mammals are not looking for permanent residences at this time, and so there shouldn't be a large concern about one or two bats showing up. The issue should resolve itself in a short period of time.

Sometimes, individual bats may accidentally enter a home through an open door or window or drop down a chimney. If this occurs, you can learn how to catch and release a single bat at batcon.org/about-bats/bats-in-homes-buildings.



Big brown bat

Q: What kind of spider is this, and what is the purpose of the zigzag pattern?

➔ This is a female black-and-yellow garden spider (*Argiope aurantia*).

The zigzag design, called a stabilimentum, helps reinforce the web. Females make vertical zigzag bands above and below the middle of the web; juveniles make circular stabilimenta in the center. The purpose, and the design, is not completely understood. It may work as camouflage for the spider lurking head-down in the center. But it also may warn birds of a hard-to-see web or attract insect prey. When prey are caught, the



Black-and-yellow garden spider

spider may undulate or vibrate the web to further ensnare its victims.

This species has a large range — it can be found from Canada to Costa Rica and throughout most of the temperate United States.

Missourians are most likely to see this spider in the late summer and fall, when large females construct magnificent webs in gardens, fields, along the eaves of houses, outbuildings, or anywhere they can anchor a thread. Males

often build smaller zigzag webs nearby. Webs tend to be rebuilt in the same place throughout the summer. Each night the spider eats the web's circular interior and rebuilds it the next morning.

Appreciated by gardeners, these spiders eat a variety of insect pests. They are not aggressive. If handled, a spider might be goaded to defend itself, but its bite is similar to a bee sting.



Corporal Marc Bagley

CARROLL COUNTY
CONSERVATION AGENT

offers this month's

AGENT ADVICE

Large flocks of blue-winged teal are among the earliest ducks to migrate south during fall, flying in during wet, cool fronts. If you are hunting during teal season, Sept. 11–26, scouting is key. Get out and seek places you might find birds. Teal are opportunistic waterbirds that land wherever they can find water. Three things to remember before hunting this season. First, don't shoot too early. Shoot time is at sunrise. Second, be sure of your bird ID. Teal are often confused with shovelnose, pintails, and wood ducks. Third, you must have a Small Game Hunting Permit, a Migratory Bird Hunting Permit, and a Federal Duck Stamp. For more information, refer to the *Migratory Bird and Waterfowl Hunting Digest 2020–2021* at short.mdc.mo.gov/ZVp.

What IS it?

Can you
guess this
month's
natural
wonder?

*The answer is on
Page 9.*



WE ARE CONSERVATION

Spotlight on
people and partners

by Angie Daly Morfeld



Kansas City Parks & Recreation

➔ In 2016, Kansas City Parks & Recreation partnered with MDC to initiate the first-ever women's managed archery deer hunt in Missouri. Located at Hodge Park, the hunt successfully merged two objectives — managing the urban deer population and introducing women to outdoor skills.

Deer management

The Hodge hunt has proven to be popular. "Participation continues to rise each year," said Joe DeBold, wildlife damage biologist for MDC's Kansas City and Northwest regions. "In 2016, there were five women participants and by 2020, it had grown to 23. As a result, 22 deer have been harvested." In addition to Hodge, hunts are hosted at five other Kansas City parks, in partnership with MDC, to successfully control the urban deer population.

In her own words

"It's been incredibly successful," said Jaci Newman, one of the first women to start the Hodge Park hunt. "It's empowering to hunt on your own, and it's cool to see women get in there and do their thing."

by Bill Graham

2017 hunters of Hodge Park

Front row (L to R): Lindsay Morerod, Jessica Hamilton, Ellen Robson, Julie Griggs, Kris O'Leary, Jaci Newman

Back row (L to R): Erica Roelofs, Krista Rettig, Kristy Hand, Michaela Schildnecht, Cherie Murphy, Maren Hansen

Not pictured: Emily Murdock, Vicki Kilgore, Katie Flynn

What's **your** conservation superpower?

MDC WELCOMES MARGY ECKELKAMP TO CONSERVATION COMMISSION

The Missouri Conservation Commission and MDC welcome Margaret "Margy" F. Eckelkamp of Washington as the newest member of the four-person commission. The Franklin County resident was appointed by Governor Mike Parson July 30 to serve a six-year term expiring June 30, 2027. The appointment is pending confirmation by the Missouri Senate.

Eckelkamp replaces Don Bedell of Sikeston, whose second six-year term as a commissioner expired June 30. As a commissioner, Eckelkamp joins Commission Chair Barry Orscheln of Columbia, Commission Vice Chair Mark McHenry of Kansas City, and Commission Secretary Dr. Steven Harrison of Rolla.

"We're elated with Governor Parson's choice to appoint Margy to the Missouri Department of Conservation Commission," said Commission Chair Barry Orscheln. "Her background in agriculture, and as a journalist, complements our mission to protect and manage the fish, forest, and wildlife of the state and to facilitate and provide opportunities for all citizens to use, enjoy, and learn about these resources. She will be a great asset for conservation, and we look forward to working with her."

Born in Columbia, Eckelkamp moved with her family to South Carolina as a child. She returned to Missouri in 2002 and lives in Washington with her husband, William Jr., and their two children, 6-year-old William III and 2-year-old Lucille.

Eckelkamp enjoys hiking, wildlife watching, and fishing on the family pond. Her husband is an avid hunter and angler and takes every opportunity to introduce their children to the outdoors.

"I am very honored and humbled to be able to serve as a conservation commissioner," Eckelkamp said. "I look forward to bringing my personal passion for conservation as well as my professional background in agriculture and communications to help the commission and MDC in the work we do."



The Missouri Conservation Commission and MDC welcome Margy Eckelkamp of Washington as the newest member of the four-person commission.

She added, "The driving goal of conservation is to ensure the next generation has the same or better opportunities to enjoy the outdoors. As a mother of two young children, it is also personally important for me to make sure we conserve nature for future generations. Missouri is rich in opportunities for all citizens to be outside and appreciate the natural resources and wildlife the state has to offer." Eckelkamp is a 2006 graduate of the University of Missouri at Columbia, where she earned a bachelor's degree in agricultural journalism with a minor in agricultural economics.

She is the editor of *The Scoop* for the *Farm Journal*. She also serves as a mentor and network member for AgLaunch, a technology accelerator, and for Missouri State University's Missouri Small Business Development Center.

The Missouri Conservation Commission consists of four members appointed by the governor with the advice and consent of the Senate. Commissioners serve six-year terms with no salary or other compensation with not more than two allowed from the same political party. Their responsibilities include appointing the MDC director, serving as MDC policy makers, approving regulations of the *Wildlife Code of Missouri*, strategic planning, and budget development and major expenditure decisions. For more on the commission, visit MDC online at mdc.mo.gov/commissioners.

WHAT IS IT? ZEBRA SWALLOWTAIL EGG

A female zebra swallowtail butterfly deposits her eggs on leaves one at a time, which provides two advantages. First, less competition for food among emerging caterpillars. Second, reduced risk of a female's entire brood being attacked by a predator or a parasite. Zebra swallowtail caterpillars depend on the foliage from pawpaw trees, so they are usually found in the same habitat as their food plants, which in this case, is bottomland forests.



THE SCAT DETECTIVE

WILDLIFE DAMAGE BIOLOGIST HELPS
HOMEOWNERS IDENTIFY MYSTERY VISITORS

by Tom Meister | illustration by Shawn Carey





My cell phone started ringing earlier than usual. Caller ID indicated it was coming from Wentzville.

“Help!” a terrified voice said. “We found huge piles of scat in our backyard and neighbor’s yard, our trash cans were knocked over, and trash spread everywhere.”

Contacts like this are an everyday occurrence in the life of a wildlife damage biologist. My job is helping people with wildlife concerns and coexisting with wildlife. To help solve issues and answer questions, properly identifying the culprit is the first step. Being successful in my job requires being a good detective. And frequently the best evidence left behind is the animal’s feces, or scat.

An animal’s scat provides unbeatable insights into its diet and behavior. Scat identification can be difficult, as scat changes according to what food is available, content of that food, and age and health of the animal. However, by asking the right questions, you can go a long way toward reducing the number of available suspects and determining the guilty critter.

In the case above, the caller went on to provide additional information that might be helpful in identifying the source of the scat, going as far as to even supply a suspect by name — Bruno, a black bear that made headlines in 2020 when his travels from Wisconsin to Arkansas took him through the St. Louis area.

“We live in a subdivision surrounded by woods, and we have seen deer, coyotes, foxes, and raccoons,” said the caller. “We are very concerned for the safety of the young children and pets in the neighborhood. We have been out west to Colorado several times. Based on what I saw there and the size of the scat piles in the yard, it must be a bear. We did have a bear close to us last summer, could it possibly be Bruno?”

Evolving Scat Piles

Later that same morning, I received an email that showed people are interested in knowing what is using their yard as a toilet.

“On April 29, I noticed a pile of poop in my yard, rather close to the front porch,” the email began. “And it was not huge, but bigger than what I have ever seen from any dog. I took a picture, scooped it up, and tossed it across the road. Next day, just about the same spot was another pile. The next day, more poop, but a little farther away from the house and right next to my fire pit. Same size, just a little different.”

The writer went on to describe how the scat piles continued to show up overnight throughout the summer and into the fall. As the seasons changed, so did the scat.

“The poop seemed to change — same size pile but a little different color and consistency,” the email read. “The piles of poop are everywhere except they are much different in shape and size. Could this be a different animal?”

Chocolate-Covered Almonds

Later the same day, a message came from Ask MDC (askmdc@mdc.mo.gov):

“We live in Macon County just north of 36 Highway,” the message read. “While out checking fence on our farm, we found these massive piles of pellets of scat all over our property shaped just like a deer scat, but they are way too big to be from deer. We have collected samples and took pictures; they are about the size of a chocolate-covered almond.”

All animals leave behind evidence in the form of scat. Looking at scat for size, content, color, and other clues will help uncover the offending animal.



The Investigations Begin

Before you begin to identify scat, consider the health hazards associated with it and be safe. Animal feces are dirty and have germs. Avoid handling without proper protection and avoid inhaling near the droppings, as some diseases, especially histoplasmosis in bat and bird droppings, can be transmitted through the air. If you handle scat, use a tool and proper personal protective equipment, or PPE, a term with which we have recently become familiar. Use gloves and masks and remember to wash your hands afterward.

There are many common and slang terms for the same thing: scat, droppings, feces, dung, manure, stools, crap, poop, and others. All are defined as the solid or semisolid remains of food that was not digested in the small intestine and has been broken down by bacteria in the large intestine.

When trying to determine the source of scat, there are several clues to look for:

Shape — Most wildlife scat will appear in one of four general shapes: plop, tubular, twisted, or pellet.

Content — Can you determine what's in the scat? The presence of seeds, bones, fur, insect parts, vegetation, grass, garbage, or plastic can lend insight into the animal's diet.

Color — The color of the scat can also help determine the general diet of the source. Is it brown, green, white, or black?

Volume — Does the scat appear as a single dropping, or as a collection of several droppings? Some animals, especially otters and raccoons, will use the same location and form a latrine.

Scent — A strong scent could indicate freshness.

Contextual — Did the source take any extra steps after leaving the scat. Are there scrapes or scratches, or an attempt to cover the scat?

Placement — Some animals defecate in prominent places, such as on logs, on top of rocks, or in the middle of a trail, in part to mark their territories.

Habitat — Knowledge of the habitat can eliminate many possibilities and help with identification.

PLOP



BLACK BEAR

Content clues: plants, insects, fish, bones
Color: black, brown, green
Volume: up to 1lb
Placement: trails, tree bases

TUBULAR



COYOTE

Content clues: fur, bones
Color: dark to bright
Volume: large volumes
Placement: trails, borders of their territory

PELLET



WHITE-TAILED DEER

Content clues: plant materials
Color: black to greenish
Volume: large amounts of pellets
Placement: everywhere



HORSE

Content clues: grass, hay
Color: dark green, brown
Volume: large fecal balls
Placement: anywhere in fields, pastures



RACCOON

Content clues: seeds, very pungent odor
Color: varies with diet
Volume: 3/4 inch
Placement: latrines — use of same location



ELK

Content clues: plant and woody materials
Color: black to green
Volume: similar to deer but even larger
Placement: everywhere



COW

Content clues: plant materials
Color: green to black
Volume: large piles
Placement: anywhere in field, pastures



RIVER OTTER

Content clues: fish scales, crawdad and shell parts
Color: black
Volume: large, latrine
Placement: mark territory along shoreline



GREY SQUIRREL

Content clues: plant materials
Color: brown to reddish
Volume: 8-10mm length
Placement: random

"Could It Be Bruno?"

Missouri's black bear population is on the rise, and with it, more cases of nuisance bears. As the black bear population increases, so does the bears' range, with males leading the way into new territory. Bears have been reported and documented in the greater St. Louis area.

We discussed the pictures of the scat, knocked over trash cans, and previous wildlife sightings. The scat was described as amorphous, and the content was a mix of natural pieces and plastic undigested material. There was a large volume and strong scent. Another thing taken into consideration was the lack of bear sightings in a very populated suburban neighborhood. There had been several recent coyote sightings, and the trash cans were merely knocked over, not mangled and destroyed like a bear could do. There were no bear tracks anywhere, and by the time the scat was reported, Bruno had been reported in southern Arkansas.

After explaining how survival instincts lead certain animals, especially coyotes, to gorge themselves and eat until all the food — or garbage in this case — is gone, even when they are full, we discussed how this could most certainly result in extra-large piles of scat. And the very strong scent was probably from the rotten meat in the garbage. Based on the evidence, the scat was likely left by coyotes, and I advised the caller how best to avoid attracting unwanted wildlife to their yard and neighborhood (see sidebar, *Simple Steps to Avoid Wildlife Conflicts*).



All evidence in this case pointed to a coyote, not a bear.

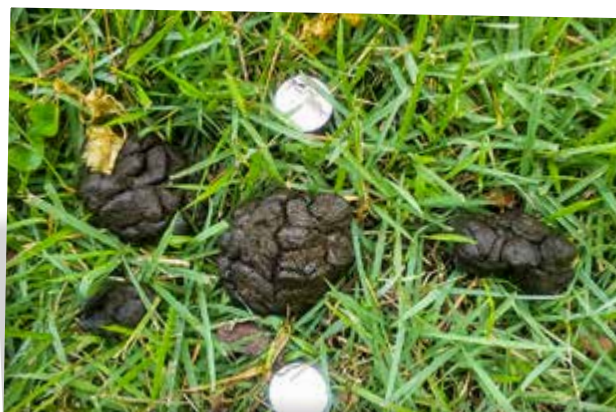
SCAT CASE #2



"The Recurring Scatter"

The investigation begins with the evidence we have. We examined the photos and discussed over the phone the one thing that was obvious: the scat changed from spring into fall. It went from a wet plop shaped into a bigger plop to a pile of dry pellet-shaped scat. How could this possibly be from the same animal? This turns the investigation into what effects scat the most — diet.

The diet for deer changes depending on availability and season. In the spring through summer, they eat soft green browse. As the season turns to fall, there is less and less green browse, so they change to hard woody browse — acorns and twigs. This would explain how the same animal's scat can look so dramatically different, and this is what solved the mystery of the changing poop piles and identified the culprits — white-tailed deer.



This case hinged on two things — timing and food.



SCAT CASE #3



"Chocolate-Covered Almond Dropper"

The evidence here was pellet-shaped scat about the size of chocolate-covered almonds. What other animal has pelletlike scat? There is a group of animals called ungulates that typically have pellet-shaped scat. That group includes moose, elk, and deer. Non-ungulates with pellet-shaped scat, but much smaller, include rabbits, squirrels, and chipmunks. We ruled out most of the pellet-pooing critters based on size, leaving us with elk or moose.

The next evidence we looked at was the location. It is highly unlikely a moose could travel unnoticed from the northern states of Minnesota or Michigan. Moose scat is also much larger than the described evidence. Therefore, by the process of elimination, that left us with elk. The landowner asked if it could be an elk from the newly restored population in the Ozarks. Again, the prospect of an elk travelling from the lower Ozarks to northern Missouri unnoticed is improbable. Further investigation by the landowner discovered trail camera photos of an elk with cattle tags in its ears. With that information and the help of social media, he found the owners of the elk, which had escaped from an elk ranch nearly 50 miles away.

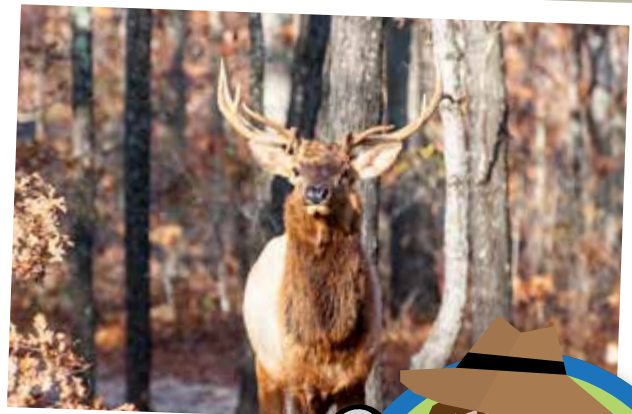
WANTED!



Simple Steps to Avoid Wildlife Conflicts

As more of us take up residence in rural areas and as metropolitan areas continue to expand into previously undeveloped areas, the prospect of conflicts between humans and wildlife increases. Residents can take a few simple steps to reduce the likelihood of those conflicts:

- Keep pet food inside and cover up doggie doors at night.
- Don't give wildlife the opportunity to get into your garbage. Store garbage in metal or plastic containers with tight-fitting lids. Keep the containers in a garage or shed, and only put them out on your scheduled pickup day.
- Bring bird feeders in at night.
- Keep your yard free of brush and refuse to reduce rodents and rabbit populations.
- Clean your grill after each use.



Location, location,
location — sometimes
that tells you all you
need to know in a case.



Scat Detectives

The next time you are out and about in your yard or anywhere in the great outdoors, apply the lessons above to any pile of mystery poo, and you might be able to identify the source — and become a scat detective. ▲

Tom Meister has been with MDC for more than 25 years, including the last 20 as a wildlife damage biologist. He is a member of MDC's response, research, and relocation teams for mountain lions, feral hogs, black bears, and elk.

Beyond *the Classroom*

NATURE-BASED PRESCHOOL TAKES LEARNING OUTSIDE

by David Catlin | photographs by David Stonner

Social interactions and the associated development of social skills is an important part of nature-based preschools.

Miss Megan calls out in a voice filled with enthusiasm. “Are we ready? Let’s put our water bottles in the basket and get our shoes on, everybody!”

Next, Miss Megan lays out a few minimalist rules.

“Frankie ... and Christa,” she says to focus some wandering attention, “We’re gonna remember that when we’re going on our adventure, we’re using our fox feet to stay right together. We don’t go too fast, and we don’t go too slow. We stay in our little fox pack, don’t we? We stay right together.”

Then, she leads the excited group down the gentle hill toward a little grove of trees below the preschool. Amid much laughter and talking, the children work together to tow a wagon load of tools and supplies with them. Once they arrive in the woods, it’s time for individual exploration.

“Miss Megan, I saw an orange spider! An’ it was wiggling!” shouts one boy.

“Wow!” she says in reply. The adventure is off to a great start.

Megan Fox, with help from husband Alan Helland and one part-time teacher, runs Forest Kindergarten at Blue Fox Farm, a nature-based preschool in rural Boone County near Ashland. Inside the little building that serves as the preschool’s “base of operations,” the scene resembles preschools all over Missouri, with children’s toys and seating scattered about and a plastic tub with monarch butterfly chrysalises hanging from the lid. But at a nature-based preschool, indoors is not where the action is. During the five-hour school day, Blue Fox Farm children typically spend four of them out in the forest, fields, and creeks on the 70-acre property.

“We’re outside at least three hours, even in the coldest weather,” says Fox. Some of that time is spent running around and making mud pies in a simple playground next to the building, she notes. “For licensing, I have to have a fenced-in play yard. But our focus is going to the woods.”



And this morning, like every morning, the woods is a diverse and fascinating place.

A young girl runs up to Miss Megan with a stick she has found.

“This is my new fishing pole,” she says proudly.

“You’ve got a fishing pole? Great!”

A few moments later, the same girl calls out from her pretend fishing hole.

“I got a fish! I got another fish!”

“You got another fish?” says Miss Megan. “Fry it up for lunch!”



At Blue Fox Farm, more than half of the school day is spent outdoors — much of it in unstructured exploration.



Building a Relationship With Nature

A dozen years ago, you might have counted all the nature-based preschools in the U.S. on your fingers and toes. But in the last decade, the idea of allowing young children to learn and develop in outdoor settings has taken flight, inspired by models in places like Norway, Sweden, Switzerland, and the United Kingdom. Now, according to Christy Merrick of the Natural Start Alliance, an arm of the North American Association of Environmental Education that supports nature-based preschools and similar programs, there are over 650.

What is driving this growth? Partly, it is a growing body of academic research that is revealing a host of benefits from letting kids spend time in the woods. Studies have found that children who spend more hours outdoors demonstrate increased imaginative play, develop better vocabulary and gross motor skills, show reduced symptoms of attention-deficit/hyperactivity disorder (ADHD), have better psychological well-being, and even exhibit a lower incidence of nearsightedness. Perhaps most significant to people who care about conservation, though, is the evidence that connection to nature in young children — fostered by unstructured play in natural settings and supported by interaction with adult mentors — leads to pro-conservation behaviors later in life.

Fox puts it this way: “Early childhood is all about relationships and one of the relationships we often kind of just skip over in traditional education — or just in the society we live in today — is the relationship with the natural world. If we want that relationship to continue, we have to start really early because that’s where the meaning is formed.”

Filling a Natural Need

Over in St. Louis County, Raintree School is bringing a similar outdoor experience to a suburban audience. Located in Town and Country, Raintree School was the first nature-based early childhood education program in Missouri and remains the largest. It boasts over 100 students from two years old through kindergarten and is in the process of extending its programs into the elementary grades.

Like a lot of founders of nature-based programs, President Ilya Eydelman was a parent who couldn’t find an existing preschool that matched his philosophies of how to develop young children.

“My wife and I started the school in 2006 after having searched and searched and searched for early childhood options for our son,” he explains. Initially, they launched their preschool in a former KinderCare building surrounded by asphalt. While they made periodic forays to local natural areas, the idea of creating a truly nature-focused program was inspired at a conference where they learned about a model program developed in Scotland.

“That really opened our eyes. We were always kind of philosophically parallel to that idea, but the whole concept of a forest school hadn’t really gelled for us until we met this group at the summit.”

It led to the creation of their current facility, which opened on a wooded 11-acre site in February 2014.

The Benefits of Failure and Risk Taking

While built upon many of the same philosophies as the forest kindergarten at Blue Fox Farm, Raintree School has adopted a Reggio Emilia approach, named after a child-driven model first developed in an Italian town of that name. One feature of the Reggio-inspired approach is the involvement of groups of children in long-term learning projects they design themselves. Besides requiring relationship-building and teamwork, the project-oriented approach allows for a lot of experiential learning.

“Failure is a big part of what we do,” says Eydelman. “We allow the kids to fail — we don’t tell them, ‘No, that won’t work.’ At one point they tried to make a prosthetic for a deer, a three-legged deer that we have on campus here. You can probably figure how that ended.”

Undeterred by the realization that deer won’t wear prosthetics, the children took a different tack. Surmising that their deer had probably been injured in a collision with a car, they decide to install deer-deterrence devices along a busy local thoroughfare. Over the next several years, they learned about deer-car collisions, found a device manufactured in the United Kingdom, went in front of the Board of Aldermen and County to get it approved, approached the Humane Society to recruit volunteer labor, and turned solving a deer problem into solving a community problem.

The idea of learning through failure extends to the risks inherent in spending time outdoors. Some parents balk at the notion of their young children traipsing around in the woods and fields because they fear ticks, poison ivy, broken bones — or worse. But, just as children learn from failure, notes Eydelman, “We want them to learn through scrapes and bruises.”

“Things happen. Kids get hurt. It’s a fact of life. Being out in the woods does not make that more prevalent,” he says. “You can crack your head open on a nicely rounded steel play set, just like you can on the boulder out there. And yet, if you look at studies, those injuries are much less prevalent on natural playscapes



The chance to experience and explore water is an important part of nature play for young children. Much of the time spent outdoors in nature-based preschools is unstructured, and learning is child-driven.

than they are on traditional commercial playscapes.” The reason, he says, is that risk is much more difficult for children to assess in man-made environments, where everything looks smooth and soft. In nature, there are fewer surprises.

Nature-based early childhood educators agree, the benefits of growing up in nature far outweigh the risks. Eydelman puts it this way: “Time and again, unstructured outdoor time has been shown to improve pretty much every metric that you want your child to excel at. Cognitive development, socio-emotional development, academic achievement. There’s something about unstructured outdoor experiences that really gets their brains working the right way.”

That’s all well and good if your children (or grandchildren) have ready access to wild places. But how can city kids benefit from nature-based early childhood education?



Children are able to experience nature first hand and gain an understanding and respect for wildlife and the environment at a young age.



"Poop is Always Exciting"

One answer to that question was launched by the Saint Louis Zoo, located in Forest Park in the heart of Missouri's largest urban area. The Saint Louis Zoo Preschool opened in 2014. Like its fellow Missouri nature-based programs, it spends at least 50 percent of its time outdoors. Much of that occurs on the zoo grounds, but every Friday participants spend the day in nearby natural habitats, including Kennedy Memorial Forest, a wild piece of ground adjoining the zoo and managed by Forest Park Forever (with financial support from MDC). It isn't pristine wilderness, Preschool Director Laura Seger acknowledges, but that doesn't matter to a 4-year-old.

"In the park, we find box turtles and aquatic turtles and lots of invertebrates. And then of course we'll see squirrels and stuff. We found a squirrel's skull — that was very exciting. That was a big deal. There was a lot of discussion about what that was, and how did it get that way." She pauses.

"Poop is always exciting. We find poop. We climb trees. We do all that stuff."

It doesn't take a big natural area to expose young children to the outdoors, Seger says.

"There's so many great spaces. There's so much potential. It really is using what you have, even if it's just one day a week. There's so many ways you can do it and connect kids that are easy and free."

Recognizing the importance of offering opportunities for nature-based learning in the urban environment, zoo leaders are planning to expand programming to a new property recently purchased in Spanish Lake, on the north side of the metro area.

Adventure Awaits

Back at Blue Fox Farm, the morning visit to the forest is winding down, but there are still discoveries to be made. One boy has found a small caterpillar, and has it crawling on his hand. Miss Megan invites other children over to see.

"Do you want to hold the fuzzy guy?" she says to a little girl. "Are you done with him, Arlo?"

"I'm done with him."

"Would you like to hold him? Put your hand right in front and see if he'll crawl on."

"NO-O-O!" says the girl.

"No, you don't want to? Okay."

"I just want to touch him," she says. And she reaches out with a finger.

"So gentle ... so gentle," coaches Miss Megan. "Okay, Arlo says he's done, so we're going to put him on a leaf now. Come on, little fuzzy guy." The caterpillar returns to the woods. Then, the children return to their home base for lunch and a nap. The adventure is over for today.

But tomorrow, another adventure awaits. ▲

David Catlin managed Springfield Conservation Nature Center for a decade before going on to work for the National Audubon Society. He now helps nature centers and nature-based preschools as a private consultant, and enjoys spending time with his grandsons in the woods and fields of southwest Missouri.



Purposeful management is critical for quail to return to Missouri's grassland and cropland landscapes.

QUAIL: NOPPADOL PACHONG; FIELD: DAVID STONNER

A bright sun shining over a green field with a wooden post in the foreground.

Bobwhites, Beef, and Bees

MISSOURI'S QUAIL RESTORATION LANDSCAPES
by Dave Hoover

Bobwhite quail have a rich and storied history in Missouri. Prior to the days of huntable deer and turkey populations there was small game, and quail was king. Known as the prince of gamebirds, northern bobwhite inspire images of cool autumn mornings, favorite shotguns, and excited bird dogs for Missourians old enough to remember the “good old days” of the 1960s and early 1970s.

Bobwhites can still be found around the state if you know where to look and are willing to stretch your legs a bit. It is no secret that places with enough good habitat hold quail, but therein lies the problem — areas of good habitat are getting harder to find.

MDC has promoted quail habitat management ever since its beginning in 1937. Programs, such as Project Bobwhite in the 1980s, Open Lands Initiative in the 1990s, Quail Emphasis Areas of the 2000s, countless landowner workshops, staff trainings, press releases, and *Conservationist* articles were all aimed at improving habitat for quail on public and private lands throughout the state. Despite this, however, bobwhite populations have continued to slowly decline over the past 50 years and that has caused many biologists, hunters, and landowners alike to pause and ask if there is a better approach — a better way to manage for quail?

A Series of Fortunate Events

In the mid-1990s, a group of biologists and conservation partners throughout the bobwhite’s range began collaborating to restore quail populations. Known as the National Bobwhite Conservation Initiative (NBCI), this movement now involves all 25 states in the bobwhite range and multiple conservation partners.

As one of the first states to fully embrace the national quail plan, Missouri is a leader in this effort, identifying private land focal areas to target management efforts in partnership with interested landowners and public land managers.

Missouri established two NBCI quail focal areas as part of this national effort to evaluate the impacts of targeted habitat management efforts. These efforts proved fruitful as both NBCI focal areas showed positive results, and not only for quail.

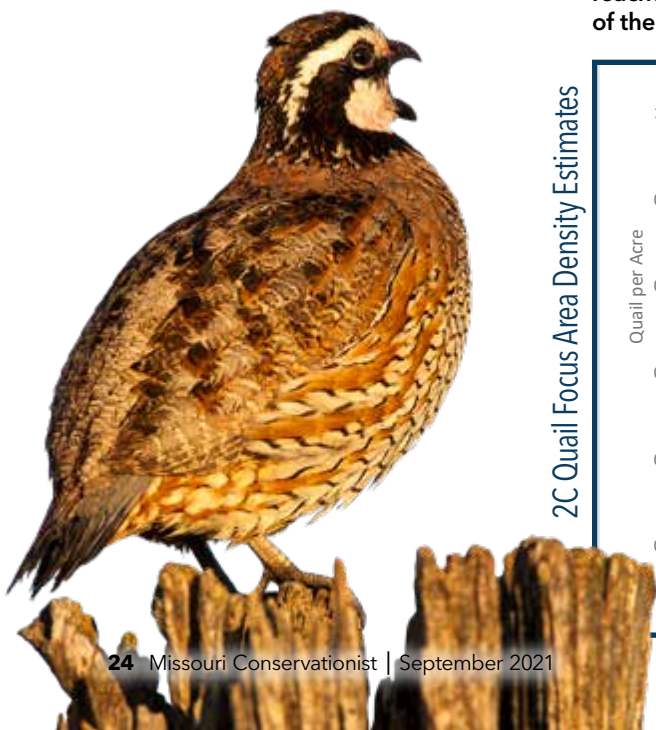
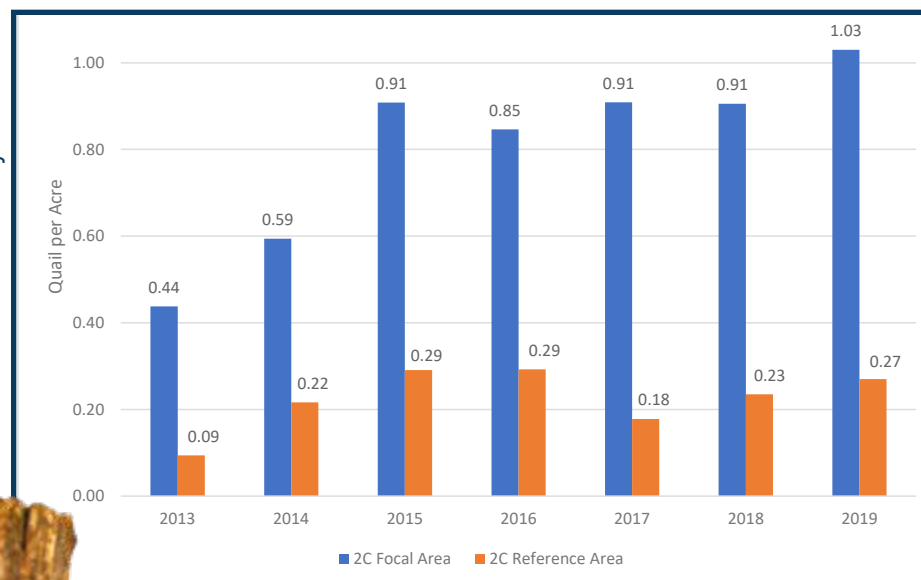
“What we learned from this work was that when interested landowners, biologists, and conservation partners work together to put native grassland habitat on the ground in a focused manner, good things happen for quail and many other species as well,” said Beth Emmerich, MDC’s upland game biologist. Emmerich also added that “during a few years of the study, bobwhite populations approached one bird per acre, which is considered by many Midwestern biologists to be the gold standard. In addition, we saw greater grassland bird numbers in the focal landscapes than in nearby control areas.”

During this same timeframe, the largest quail research project in Missouri’s history was concluding and yielding some intriguing results (see August 2019 *Conservationist* article, *A New Approach to Quail: Grassland Management Key to Quail Recovery* for more information). An important take home message from this study was that native grassland areas managed with fire and/or moderate grazing are preferred by bobwhite quail and many other species associated with good quail habitat.

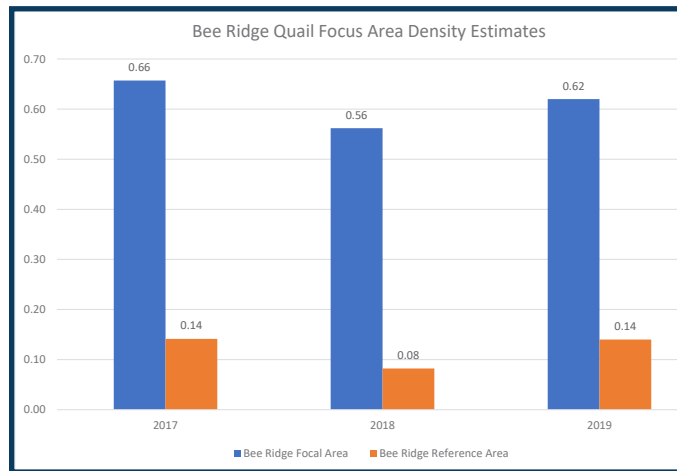
“Diverse native grasslands, with lots of forbs, were far superior for quail production and survival as compared to areas managed with a mix of food plots and cool-season grasses, or old fields,” said Kyle Hedges, MDC district supervisor and co-lead on the nesting portion of the study. “We also found that the grasslands need frequent disturbance to remain productive for quail production. Either fire or moderate grazing or both in the last year proved to receive the highest use by quail broods and adults during the nesting season.”

Quail populations in the 2C Quail Restoration Landscape where habitat management is emphasized (focal area) were substantially greater than in similar areas receiving little or no management (reference areas). In 2019, fall quail numbers reached 1 bird/acre, which is considered by many Midwestern biologists to be some of the highest densities achievable in areas subjected to severe winter weather.

2C Quail Focus Area Density Estimates



To cap it all off, a national movement to save the monarch butterfly and other native pollinators was in full swing, and an alarming report on the dramatic decline of America's songbirds was soon to be released. Something had to change. The way biologists, landowners, and hunters alike had been approaching quail management had some success, as demonstrated by the results in Missouri's two NBCI focal areas and select public lands; however, these changes are not on a large enough scale to sustain the initial population recoveries in many cases. In addition, many of the other species that benefit from the establishment of good quail habitat were continuing to decline.

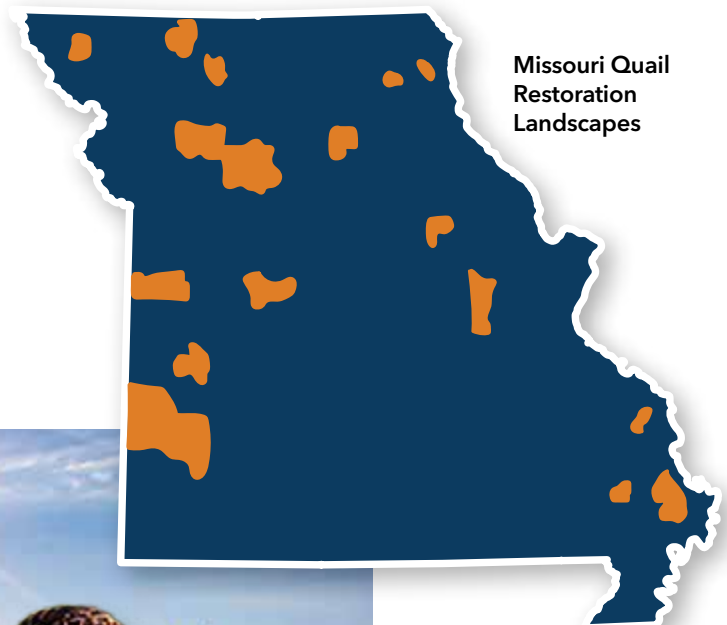


Much like the 2C QRL, the quail population in the Bee Ridge QRL focal area was much greater than in areas with little or no management (reference area).

A Systems Approach to Quail Conservation

In 2018, MDC established multiple quail restoration landscapes (QRLs) to focus management efforts for bobwhites in landscapes around the state deemed most suitable to yielding positive population responses with purposeful management. The process to establish the QRLs included information used when defining the conservation opportunity areas (COAs) along with biologists' experience and regional staff input. The result was the identification of landscapes around the state with purposeful management were best suited to achieve positive population responses for quail, as well as grassland songbirds and native pollinators.

"To be clear, these areas are not the only places the department and conservation partners will conduct work on public lands or assist private landowners. They are simply some of the best places to focus limited resources to achieve maximum results," added Emmerich.



Missouri's quail restoration landscapes represent some of the best places to focus purposeful management for quail and yield benefits for multiple grassland species and native pollinators.



Grassland Landscapes

The results of the quail research project confirm the importance of conserving and managing Missouri's native grasslands. This unique and increasingly rare habitat not only serves as important breeding habitat for quail but is vital to Missouri's grassland-dependent wildlife species. However, it is not enough to simply have a piece of one of the rarest habitats in North America, it also needs to be managed.

"Good quail and grassland bird habitat includes a robust and diverse native forb community in a large, open landscape with scattered clumps of native shrubs, such as dogwood, wild plum, and blackberry," said Frank Loncarich, MDC's wildlife management biologist and co-lead on the nesting portion of the study. "Grazing is the best tool for creating the vegetative structure that facilitates easy brood travel, attracts abundant insects — a vital food source for quail and grassland bird chicks — and is an excellent way to put weight on cattle during the summer, when most cool-season grasses are not performing well."

Grazing native forages can improve summer weight gains, eliminating the "summer slump" associated with cool-season forages, and extend the grazing season, thus reducing the amount of supplemental feed required.

By focusing management efforts on creating diverse vegetative structure, like variation in height and thickness of the vegetation, these areas provide abundant habitat for grassland songbirds and native pollinators as well.

"By using burning and moderate grazing to manage the entire grassland, we see more uniform use of the entire suite of grassland birds across the area," added Loncarich.

Diverse native grassland habitat provides the necessary vegetative structure for quail nesting and brood rearing, abundant food resources, and superior summer grazing for cattle.



Quail chicks are not much bigger than bumblebees when hatched and need open habitat at ground level to forage for insects and thermoregulate.



Summer grazing unit on public lands. Moderate grazing during the summer months creates habitat beneficial to quail, grassland songbirds, and native pollinators.



Bobolink



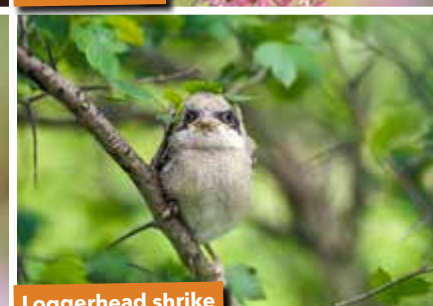
Eastern bumblebee



Monarch



Longhorn bee



Loggerhead shrike

Diverse native grassland field borders and buffers can benefit multiple species of conservation concern and supplement farm income.

Cropland Landscapes

Cropland landscapes have long been synonymous with quail habitat. During the early years of European settlement, the fragmentation of the landscape provided by small-scale agriculture increased habitat for bobwhite quail and many other grassland and woodland wildlife species. However, as field sizes grew and crop diversity decreased, habitat dwindled. Today's croplands provide little permanent habitat for quail and grassland wildlife. However, simple practices, such as establishing native grassland field borders and buffers on the least productive acres, edge feathering mature fence rows and woodland borders, and using cover crops, can improve habitat tremendously while having little to no impact on agricultural production. In fact, targeted restoration of native grassland habitats on as little as 7 percent of cropland can yield positive population responses for quail, grassland songbirds, and native pollinators.

How to Help

Habitat management for bobwhite quail, grassland songbirds, and native pollinators is not something Missourians think about on a routine basis. However, there are some simple practices that can greatly improve habitat conditions for these species. Consider implementing the following practices to help restore Missouri's quail, grassland birds, and pollinator populations:

- Plant native grassland crop field borders
- Plant native forages for livestock grazing
- Eliminate fall tillage
- Utilize cover crops
- Renovate mature tree fence lines
- Edge feather woodland borders
- Manage appropriate forested areas as open woodland or savanna

The concept of QRLs is not just to increase quail population numbers, but to establish diverse native grassland habitats in a focused manner to accomplish a whole suite of benefits. Those benefits are good for the wildlife as well as the landowner.

You don't have to be passionate about quail, or even grassland songbirds. Maybe what you really care about is better cattle performance during the summer, reducing in-field production costs, or seeing more monarch butterflies. Whatever your motivations for restoring diverse native grassland habitats, doing so in a focused approach like the QRLs can yield benefits far beyond the original intent.

For ideas on how to improve your property, visit short.mdc.mo.gov/ZV2. ▲

Dave Hoover is the regional resource management supervisor in MDC's Northwest Region. He previously served as MDC's small game coordinator.

Get Outside

in SEPTEMBER



Pawpaw

→ Ways to connect with nature

The Leaves — They Are A'Changin'

Track the progress of Missouri fall color as it wafts across the state's treetops. Fall color season begins with the brilliant reds of sumacs, poison ivy, Virginia creeper, and dogwoods. Hackberry, black walnut, green ash, and cottonwood trees join the show with their early-turning yellow leaves. For more information on fall color, including the best places to see it, visit mdc.mo.gov/fallcolor.



VIRTUAL

Reading the Deer Woods

Thursday • Sept. 16 • 6-7:30 p.m.

Online only

Registration required by Sept. 15 at short.mdc.mo.gov/ZVM or 888-283-0364

All ages

Scouting and a little "woodsman" knowledge are important for a great outdoor experience and harvest. This program will be beneficial to novice hunters interested in deer habits and scouting, deer stand placement, and we will have a virtual look at acorns and browse plots.

Snails by Land and Water

Lingering heat affects snails, both in the water and on the land, in September. Pulmonate pond snails crawl to the water's surface to take in air on hot days, due to declining oxygen in the water. Land snails retreat to their shells or burrow in a cool spot on hot days, trying to prevent drying out.



Land snail

Natural Events to See This Month

Here's what's going on in the natural world.



Deer mice store seeds and nuts underground.



Watch for migrating broad-winged hawks.



Black walnuts ripen through October.

Early Morning Caller

Fall is a gatherer's dream in Missouri! From fruits to nuts, nature is literally ripe for the picking. Just one example of this bounty — pawpaws are ripe through October. But you better act fast if you want to eat them. Raccoons, squirrels, and opossums will also be scavenging for this wild edible. To find more ripe edibles available this month, visit the online *Field Guide* at mdc.mo.gov/field-guide.

VIRTUAL

Native Plants

Thursday • Sept. 16 • 12-1 p.m.

Virtual event at Anita B. Gorman Conservation Discovery Center,
4750 Troost Ave., Kansas City, MO 64110

Registration required at the Deep Roots website at
deeproots.org/native-plants-at-noon

Virtually tour the native landscape at MDC's Anita B. Gorman Conservation Discovery Center. Guided by native landscape specialists Alix Daniel and Cydney Ross, this monthly series features a live look at native plants of interest throughout the year. This program is a partnership with Deep Roots.

Aster / Giant swallowtail



Not Just for Beauty

Asters and goldenrods contribute to the beautiful fall color landscape. There are more than 20 species of each of these flowers, but they add much more than just beauty and color to nature. They provide vital late-season nectar for butterflies, insects, and other pollinators.



False
dragonhead,
also known as
obedient plant,
blooms.



Lined
snakes
mate in
autumn.

WITHOUT TREES...
WE'D BE UP A CREEK
WITHOUT A PADDLE.



FIND OUT HOW TREES
PROTECT OUR WATER



trees  work
TM

www.TREESWORK.org

Places to Go

CENTRAL REGION

Three Creeks Conservation Area

Bad math makes for one great outdoor opportunity

by Larry Archer

✕ It's the classic case of bad math adding up to a great outdoor experience. Take three creeks, add two trails, and you get one great outdoor opportunity. That's the equation visitors encounter at Three Creeks Conservation Area (CA) in Boone County.

"Three Creeks, being right south of Columbia, gets lots of use on it basically year-round," said Three Creeks CA Manager Bob Rives. "But during the summer months into the fall, we usually just see a lot of hiking, camping, and then it's got an active horseback riding community as well."

Fueling this activity is the area's 8-mile Three Creeks Trail, a multiuse trail allowing hiking, biking, and horseback riding, and its 3-mile hiking-only Turkey Creek Trail. Running through the 1,500-acre, primarily wooded area, the trails' terrain provides users with a variety of views, Rives said.

"Having the Bonne Femme, the Bass, and the Turkey creeks — making the Three Creeks — creates a lot of bluffs, so you get a lot of topography and you get a lot of different natural communities and forest types, from bottomland forest all the way up to woodlands pretty quickly over the landscape."



"You have a lot of interesting bluff work, especially as you go down into the bottoms along these creeks."

—Three Creeks CA Manager
Bob Rives

NORPADOL PAOTHONG



Great blue lobelia blooms in late summer at Three Creeks CA. The flowers can be found along spring branches and seepy areas, and along edges of streams.



THREE CREEKS CONSERVATION AREA

consists of 1,500.5 acres in Boone County.
From Columbia, take Highway 63 south 5 miles,
then Deer Park Road west 1.75 miles.

38.851, -92.278

short.mdc.mo.gov/ZDN

573-815-7900

WHAT TO DO WHEN YOU VISIT



Birdwatching Included in the National Audubon Society's Central Missouri Hills Important Bird Area (short.mdc.mo.gov/ZDp). Included in the Great Missouri Birding Trail (short.mdc.mo.gov/ZDc). The eBird list of birds recorded at Three Creeks CA is available at short.mdc.mo.gov/ZDq.



Camping Open camping (Except during deer and turkey season).



Fishing Black bass, white bass, sunfish.



Hiking Three Creeks Trail (8-mile multiuse trail); Turkey Creek Trail (3-mile hiking trail).



Hunting Deer and turkey

Deer and turkey regulations are subject to annual changes, so refer to the Spring Turkey and Fall Deer and Turkey booklets for current regulations.

Also **quail, rabbit, and squirrel**

WHAT TO LOOK FOR WHEN YOU VISIT



Indigo bunting



Pickerel frog



Sycamore



Red-tailed hawk



North American Deermouse

Peromyscus maniculatus

Status

Abundant

Size

Length: 6 inches or less; weight: 1 ounce or less

Distribution

Statewide

The North American deermouse is a small rodent with large, protruding, black eyes and large, scantily furred ears. In Missouri, you are most likely to see deermice between March and June in open habitats such as pastures, meadows, prairie, cultivated fields, and along field borders and fencerows.



Did You Know?

Deermouse nests are generally located underground in cavities among the roots of trees or shrubs, beneath a log or board, or in a tunnel built either by another animal, but no longer used by it, or by the mouse itself.



LIFE CYCLE

Deermice breed primarily in spring and fall. Gestation lasts anywhere from 21 to 23 days, after which one to nine young are born per litter. Mated mice usually stay together during the breeding season, if both survive; otherwise, new mates are acquired. In the wild, deermice may live as long as two years. However, fewer than one-fifth of those born usually reach sexual maturity.



ECOSYSTEM CONNECTIONS

Deermice are very important as a prey species for carnivorous animals. In fact, when they are abundant and form a ready supply of food, their predators likewise become abundant. In addition, their waste products return nutrients to the soil. The value of this fertilization is considerable.



FOODS

North American deermice feed on insects, nuts, wild seeds, domestic grain, fruits and fruit pits, and some leafy vegetation. In the fall, deermice carry seeds and nuts in their small cheek pouches — which together hold 1 teaspoon — and store the bounty in holes in the ground, old bird's nests, or in trees. Deermice do much of their feeding at these storehouses, where as much as 1 pint of food may be held.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖

Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Release:
March 1, 2022–May 27, 2022
- ▶ Catch-and-Keep:
May 22, 2021–Feb. 28, 2022

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2021

Nongame Fish Giggling

Impounded Waters, sunrise to sunset:
Feb. 16–Sept. 14, 2021

Streams and Impounded Waters,
sunrise to midnight:
Sept. 15, 2021–Feb. 15, 2022

Paddlefish

On the Mississippi River:
Sept. 15–Dec. 15, 2021

Trout Parks

Catch-and-Keep:
March 1–Oct. 31, 2021

Catch-and-Release:
Nov. 12, 2021–Feb. 14, 2022

HUNTING

New Black Bear Hunting Season

MDC will offer Missourians the state's first black bear-hunting season in modern history starting this fall. Learn more at short.mdc.mo.gov/ZrK.

Black Bear*

Oct. 18–27, 2021

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2021

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2021–March 3, 2022

Deer

Archery:

Sept. 15–Nov. 12, 2021

Nov. 24, 2021–Jan. 15, 2022

Firearms:

- ▶ Early Youth Portion (ages 6–15):
Oct. 30–31, 2021
- ▶ November Portion:
Nov. 13–23, 2021
- ▶ Late Youth Portion (ages 6–15):
Nov. 26–28, 2021
- ▶ Antlerless Portion (open areas only):
Dec. 4–12, 2021
- ▶ Alternative Methods Portion:
Dec. 25, 2021–Jan. 4, 2022

Dove

Sept. 1–Nov. 29, 2021

Elk*

Archery:

Oct. 16–24, 2021

Firearms:

Dec. 11–19, 2021

Groundhog (woodchuck)

May 10–Dec. 15, 2021

Pheasant

Youth (ages 6–15):

Oct. 30–31, 2021

Regular:

Nov. 1, 2021–Jan. 15, 2022



Quail

Youth (ages 6–15):

Oct. 30–31, 2021

Regular:

Nov. 1, 2021–Jan. 15, 2022

Rabbit

Oct. 1, 2021–Feb. 15, 2022

Sora, Virginia Rails

Sept. 1–Nov. 9, 2021

Squirrel

May 22, 2021–Feb. 15, 2022

Teal

Sept. 11–26, 2021

Turkey

Archery:

Sept. 15–Nov. 12, 2021

Nov. 24, 2021–Jan. 15, 2022

Firearms:

- ▶ Fall: Oct. 1–31, 2021

Waterfowl

See the Migratory Bird and Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.

Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2021

Woodcock

Oct. 15–Nov. 28, 2021

**Only hunters selected through a random drawing may participate in these hunting seasons.*

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.



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This dainty, bluish-gray butterfly frequents a wide variety of flowers, making it a common sight statewide. Yet, few Missourians know its name! Look for the eastern tailed-blue flying around fields, residential yards, and any open, sunny habitats through November. Where will you discover one?

📷 by **Noppadol Paothong**

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